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(54) **Releasable Connection Between Component Parts (Figure 1)**

(57) A releasable connection between two component parts (e.g. of a flying body) such as a load-carrying tip 2 and a propulsion unit 3, comprises an annular element 4 made from a prestressed brittle material, such as glass, which serves as a connecting element and associated with which is a device 8 for initiating self-destruction of the element 4 as a result of inherent stress therein. The device 8 comprises a spike or punch 7 which is adapted to be propelled to engage with the element 4 and may be electrically triggered. In an alternative embodiment, the annular disc 13 (Figure 2) serves to block retaining pawls 9 from moving to a position permitting release of the coupling.

Fig.1

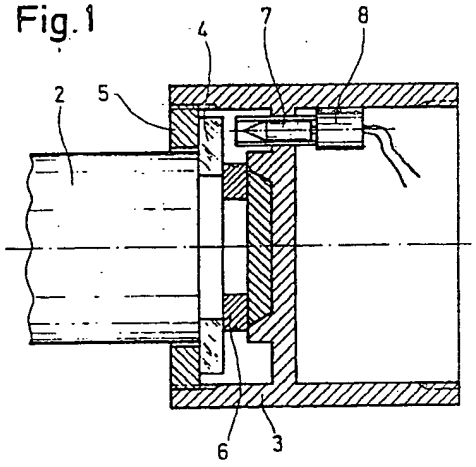

Fig.2

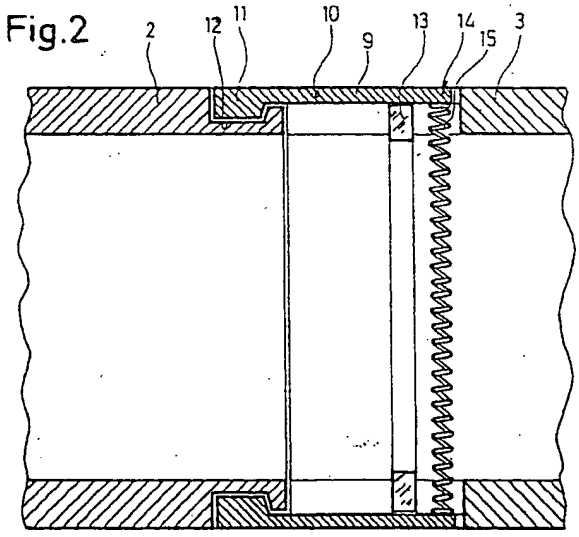

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Fig.1

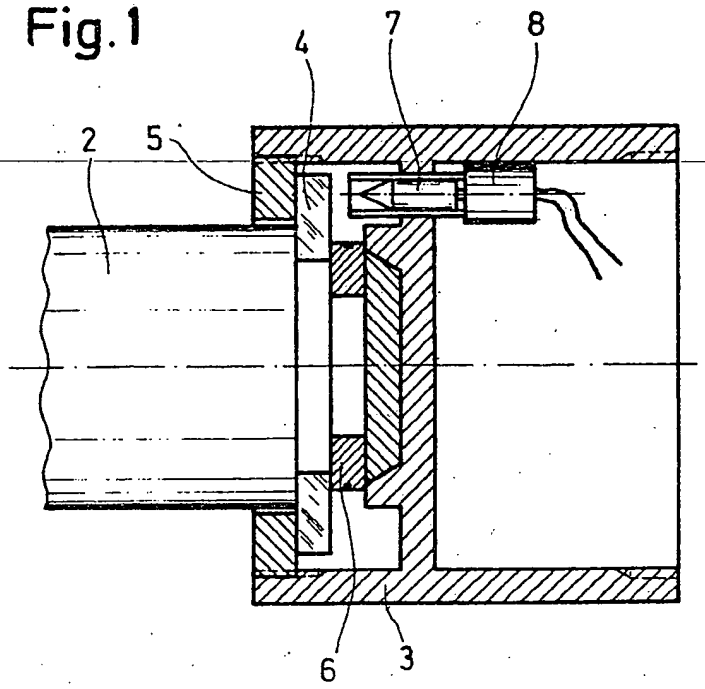
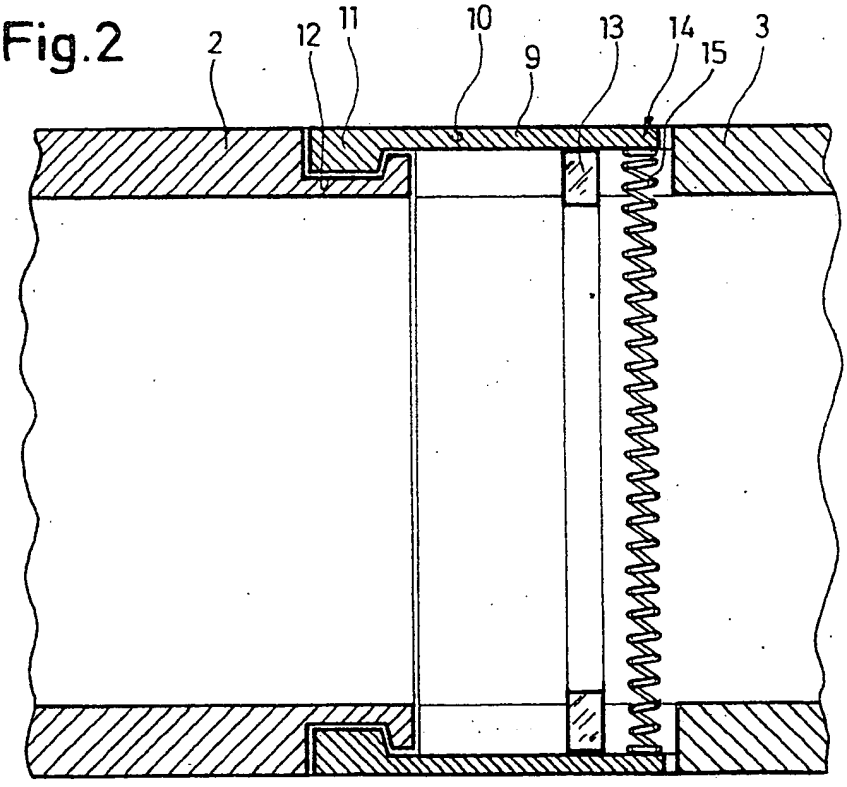


Fig.2



SPECIFICATION

A Releasable Connection Between Component Parts, for example of a Flying Body

This invention relates to a releasable connection between components parts, for example of a flying body.

From "Jet Propulsion", Oct. 1956, Part 2, pages 145 *et seq*, it is known to act on mechanical connecting elements, which can simultaneously serve as safety members, with the aid of gas pressure, produced by a pyrotechnical source of power, at a predetermined time, to eject said elements from the structure of which they form part or to draw said elements into the structure, in order thereby to release the original secure connection maintained between the component parts by the connecting elements, for any desired purpose. As applied to two-part or multi-part flying bodies, the preclusion of interference with the direction of flight by the ejection or drawing-in of such connecting elements is problematical.

The task of the present invention is, therefore, to develop a connection of the kind mentioned at the introduction hereof which is reliable, with simple design and small space requirement, and which in case of need is releasable in a particularly rapid manner, in a way which obviates ejection of drawing-in of connecting elements, and thus eliminates the need for providing devices for this purpose.

In accordance with the invention, this problem is solved in that it provides a releasable connection between two component parts, for example of a flying body, characterised in that it comprises an annular element made of prestressed glass or other brittle material and serving as a connecting element or as a blocking member for locking or retaining one or more connecting elements in their effective positions, and, associated with the annular element, a device, actuatable in case of need, for initiating self-destruction of said annular element as a result of inherent stress therein.

The sizes of the fragments into which the annular element, basically having a high strength, of glass or glass-like brittle material, completely disintegrates depends upon the degree of inherent stress therein, which may be thermally and/or chemically produced prestress. The disintegration is initiated by local mechanical overloading of the element or upon destruction of a prestressing layer thereof, for example by scratching the same. Examples of devices which are suitable for this purpose are, inter alia, a charge for the production of pressure gas or an impact spike or punch which is drivable by means of spring force or pressure gas.

The invention will be described further, by way of example, with reference to accompanying drawings, in which:

Fig. 1 is a fragmentary part-sectional side elevation illustrating a releasable connection between component parts of a flying body (e.g. of a missile or space vehicle) such as a load-carrying nose and a propulsion unit; and

Fig. 2 is a part-sectional side elevation, comparable with Fig. 1, but illustrating a second embodiment.

Fig. 1 illustrates, diagrammatically, two components of a flying body, such as a missile or space vehicle, and illustrates the rear end of a load carrying nose or head 2, for example in the form of a warhead, and the front end 3 of a propulsion unit. The two components 2 and 3 are connected and held together by an annular element 4 made of prestressed glass or glass-like material, behind which there engage, at the side of the load-carrying tip 2, a radially-inwardly-extending annular collar 5 of the propulsion unit 3 and, at the side of the latter, a radially-outwardly-extending annular collar 6 of the load-carrying tip 2. Self-disintegration of the annular connecting element 4 can be initiated, at a predetermined point in time, by local mechanical overloading or by scratching of this annular connecting element 4. Suitable for this purpose are devices, such as a charge for the production of pressure gas, or a spike or punch 7 which consists, for example, of ceramic material and which is actuatable by spring force or a pressure gas, for example from a source of pressure gas in the form of an ignition pallet 8.

In Fig. 2, releasable connection of the load-carrying tip 2 to the driving part 3 is achieved by a plurality of similar connecting elements 9 distributed at spacings around the connection. The form of each connecting element 9 is that of a pawl which is mounted for rotation at 10. Each pawl-like element 9, when in its effective position, engages by a respective claw 11 into a recess 12 at the read end of the load-carrying tip 2. For locking or retaining the pawl (or pawls 9 in the illustrated operative position(s) is an annular element 13 made from prestressed glass or glass-like material. This is arranged on the pawl between the point of rotation 10 and pawl end 14 which is remote from the claw 11 and which is spring-loaded in the direction of the arrow 15, namely for the purposes of unlatching the claw 11 from the recess 12 after disintegration of the annular blocking member 13. This disintegration can be initiated in the same way as in the case of the embodiment in accordance with Fig. 1.

Claims

1. A releasable connection between two component parts, for example of a flying body, characterised in that it comprises an annular element made of prestressed glass or other brittle material and serving as a connecting element or as a blocking member for retaining one or more connecting elements in their effective positions, and, associated with the annular element, a device, actuatable in case of need, for initiating self-destruction of said annular element as a result of inherent stress therein.

2. A releasable connection as claimed in claim 1, characterised in that the device associated with

the annular element for initiating its self-destruction is a spike or punch which is actuatable by spring force or pneumatically.

3. A releasable connection as claimed in claim 1, characterised in that the device associated with the annular element for initiating its self-destruction comprises a charge for producing pressure gas.

4. A releasable connection between two component parts, for example of a flying body, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.

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